

IN THE CLAIMS

1      Claims 1-65 (Canceled).

1      66. (Previously presented) A system that acquires and analyzes spectral images of a  
2      wafer, the system comprising:

3            a plurality of stations;

4            a transfer mechanism operable to transfer the wafer between each of the plurality of  
5      stations;

6            an illumination source that illuminates the wafer as the wafer is transferring  
7      between the plurality of stations;

8            a spectral imager configured to detect light of the illumination source that is  
9      reflected from the wafer as the transfer mechanism is transferring the wafer between the  
10     plurality of stations, the spectral imager configured to produce a plurality of one-  
11     dimensional spectral frames using information of the light reflected from the wafer as the  
12     wafer is transferring between the plurality of stations; and

13          circuitry for analyzing said plurality of one-dimensional spectral frames and  
14          aggregating at least one of the one-dimensional spectral frames to form two-dimensional  
15          spectral images.

1      67. (Previously presented) The system of claim 66, wherein the wafer includes a  
2      substrate and at least one layer of at least one thin film on the substrate, wherein the at  
3      least one thin film includes a plurality of properties, wherein the plurality of properties  
4      comprise a thickness value of the at least one layer at one or more sites on the wafer.

1      Claim 68 (Canceled).

1      69. (Previously presented) A method for imaging a wafer having one or more film  
2      layers, comprising:

3            illuminating the wafer with light;

4           positioning the wafer so that a portion of the wafer is illuminated;  
5           detecting light reflected from the portion of the wafer using a spectral imager  
6       configured to produce a sequence of one-dimensional spectral frames while the spectral  
7       imager and the wafer undergo relative motion provided by a transfer mechanism moving  
8       the wafer between a plurality of stations;  
9           aggregating said sequence of one-dimensional spectral frames to form a two-  
10      dimensional spectral image, and analyzing said two-dimensional image to determine a  
11      property of the film layers.

1     70. (Previously presented) The method of claim 69, wherein the property is a thickness  
2      value of one of the one or more film layers at one or more sites on the wafer.

1     Claim 71 (Canceled).

1     72. (Previously presented) A CMP system that images a wafer, comprising:  
2           a plurality of stations for performing one or more aspects of a CMP process;  
3           a wafer transfer mechanism disposed within the system to transfer the wafer  
4       between said stations;  
5           a light source for illuminating the wafer while the wafer transfer mechanism is  
6       transferring the wafer between the stations;  
7           a spectral imager disposed to detect light from the light source that is reflected from  
8       the wafer and configured to produce a plurality of one-dimensional spectral frames while  
9       said spectral imager and the wafer undergo relative motion provided by said wafer  
10      transfer mechanism; and  
11           circuitry for processing said plurality of one-dimensional spectral frames, wherein  
12       the circuitry aggregates sequential one-dimensional spectral frames to form a two-  
13      dimensional spectral image, and analyzes said two-dimensional spectral image to  
14      determine one or more properties of one or more film layers of the wafer.

1    73. (Previously presented) The system of claim 72, wherein the one or more properties  
2    include a thickness value of one of the one or more film layers at one or more sites on the  
3    wafer.

1    Claim 74 (Canceled).

1    75. (Previously presented) A method for imaging a wafer having one or more film  
2    layers, comprising:  
3         illuminating the wafer with light;  
4         positioning the wafer so that a portion of the wafer is illuminated;  
5         detecting light reflected from the portion of the wafer using a spectral imager  
6    configured to produce a sequence of spatially contiguous one-dimensional spectral frames  
7    while said spectral imager and the wafer undergo relative motion provided by a transfer  
8    mechanism used to move wafers between stations; and  
9         aggregating said frames to form a two-dimensional spectral image.

1    76. (Previously presented) The method of claim 75, further comprising analyzing the  
2    two-dimensional spectral image, wherein analyzing determines a film layer thickness  
3    value of one of the one or more film layers at one or more sites on the wafer.

1    Claim 77 (Canceled).

1    78. (Previously presented) A semiconductor wafer processing system that acquires and  
2    analyzes spectral images of a wafer prior to, during, and/or following a process, the  
3    system comprising:  
4         a plurality of stations;  
5         a wafer transfer mechanism disposed within the system to transfer the wafer  
6    between the stations;  
7         a light source for illuminating the wafer while the wafer is transferred between said  
8    stations;

9           a spectral imager disposed to detect light from the light source that is reflected from  
10          the wafer, the spectral imager is configured to produce a plurality of one-dimensional  
11          spectral frames while said spectral imager and the wafer undergo relative motion  
12          provided by said wafer transfer mechanism; and

13           a processor for analyzing said plurality of one-dimensional spectral frames, wherein  
14          the processor aggregates sequential one-dimensional spectral frames to form two-  
15          dimensional spectral images.

1       Claims 79 and 80 (Canceled).

1       81. (Previously presented) The system of claim 78, wherein the process includes one or  
2          more of a CVD process, a CMP process, or a stand-alone metrology process.

1       82. (Previously presented) The system of claim 78, wherein the stations include one or  
2          more of a load station, an unload station, or a process station.

1       83. (Previously presented) The system of claim 78, wherein the lights source is one of  
2          pulsed or continuous while said spectral imager detects light.

1       84. (Previously presented) A semiconductor wafer processing system that provides and  
2          analyzes spectral images of a wafer having one or more film layers prior to, during,  
3          and/or following a process, the system comprising:

4            a wafer transfer mechanism disposed within the system to transfer the wafer  
5          between a load station and a wafer chuck;

6            a light source for illuminating the wafer while the wafer is transferred between said  
7          load station and said wafer chuck;

8            a spectral imager disposed to detect light reflected from the wafer and configured to  
9          produce a one-dimensional spectral frame while said spectral imager and the wafer  
10         undergo relative motion of transferring the wafer; and

11           a processor that analyzes said one-dimensional frame.

1      Claims 85 and 86 (Canceled).

1      87. (Previously presented) A semiconductor wafer imaging system that acquires and  
2      analyzes spectral images of a wafer having one or more film layers, the system  
3      comprising:

4            a first processing system that performs a first manufacturing process on the wafer;  
5            a second processing system that performs a second manufacturing process on the  
6      wafer, where said second manufacturing process follows said first manufacturing process;  
7            a wafer transfer mechanism disposed to transfer the wafer between said first  
8      processing system and said second processing system;  
9            a light source for illuminating the wafer while the wafer is transferred between said  
10     first processing system and said second processing system;  
11           a spectral imager disposed to detect light from the light source that is reflected from  
12      the wafer during the transfer, and configured to produce one-dimensional spectral frames;  
13      and  
14           circuitry for aggregating said one-dimensional spectral frames to form a two-  
15      dimensional spectral image and analyzing said two-dimensional spectral image to  
16      determine a film layer property of the one or more film layers.

1      88. (Previously presented) The system of claim 87, wherein the one or more film layer  
2      properties ~~is~~ include a thickness value of one of the one or more film layers at one or  
3      more sites on the wafer.

1      89. (Previously presented) A method of obtaining and analyzing a spectral image of a  
2      wafer having one or more film layers, the method comprising:  
3            securing the wafer from a first processing system using a transfer mechanism;  
4            illuminating the wafer with light from a light source;  
5            positioning the wafer using said transfer mechanism so that a portion of the wafer is  
6      illuminated by light from said light source;

7       detecting light reflected from said portion of the wafer using a spectral imager  
8   configured to produce a sequence of contiguous one-dimensional spectral frames while  
9   said transfer mechanism moves the wafer;  
10      aggregating said sequence of contiguous one-dimensional spectral frames to form a  
11   two-dimensional spectral image;  
12      analyzing said two-dimensional image to determine one or more film layer  
13   properties of the one or more film layers; and  
14      transferring the wafer to a second processing system.

1   90. (Previously presented) The method of claim 89, wherein the one or more film layer  
2   properties **is** include a thickness value of one of the one or more film layers at one or  
3   more sites on the wafer.

1   Claims 91-155 (Canceled).